

Plainview Road / Patchen Woods Subdivision Stormwater Study



PREPARED BY:

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Background

The Plainview Road / Patchen Woods Subdivision Stormwater Study was completed to investigate the existing storm water infrastructure deficiencies with recommendations for improvement. The area of interest in particular is 401 and 405 Plainview Road. The sub-watershed, located within the West Hickman Sewer Shed, is approximately 53 acres in area. ***Please See Sheet C1.0 in the Appendices of this Report.*** Over the years the property in the immediate vicinity of has experienced overland flooding, structural flooding, street flooding, and sanitary sewer overflows.

Project Scope

The scope of this study primarily focuses on analyzing the hydraulic conditions of the existing storm water infrastructure within the subject watershed and the flooding impact of the properties located at 401 and 405 Plainview Road. ***Please See Sheet C1.1 in the Appendices of this Report.*** The scope of the study also included looking at the documented surface flooding within the rear yard of 420 Plainview Road.

During the study several tasks were undertaken including the review of previous studies, interviewing impacted neighborhood residents in the immediate vicinity of the area of interest, performing a field survey of the storm water infrastructure within the subject watershed, conducting a hydrologic/hydraulic analysis of existing conditions within the watershed, and the preparation of a summary of the findings with alternative solutions to mitigate the storm water flooding for the 25 year 24 hour storm event. Opinions of Probable Cost for each solution are included with the alternate solutions.

Due Diligence

The following information was reviewed and acquired as part of our due diligence for our stormwater study:

Kennoy Report - The previous report completed by Kennoy Engineers in 1983, USA Map Panel number 50. This report reflected the existing detention basin downstream of 405 Plainview Road.

Stormwater Management Evaluation by PDR Engineers, dated 1993: The report from 1993 did not address this sub-watershed (Subwatershed #2 – Lexington Reservoir).

Lex-Call and LFUCG Reports: The report from September 30, 2009 states that the smoke testing of the sanitary sewer resulted in smoke from Curb Inlets at 384, 389, and 401 Plainview Road. A review of the Lex-Call call logs, resident photos and videos, and emails to LFUCG indicate numerous flooding and SSO problems within the impacted area. It should be noted that that this study does not include SSO related issues.

Field Surveying – The storm water infrastructure was surveyed by BTM Engineering during the week of November 15, 2010. The survey included a detailed topographic survey of the properties located at 401 and 405 Plainview Road. Additionally the entire storm water infrastructure within the subject watershed was mapped and indentified to properly conduct the hydrologic/hydraulic (H& H) analysis. The aforementioned stormwater infrastructure included: storm sewer inlets, pipes, catch basins, headwalls,

and overland flow paths. All of this information was then imported and merged into the latest GIS mapping of the area provided by LFUCG.

Plat Investigation – The owner has provided photographic captures of a plat from 1979, showing 405 Plainview as part of the retention basin lot. At a later date the plat was amended to allow the lot to become a buildable lot.

Hydrologic Investigation – Videos and photos provided from an area resident document the May 1-May 2, 2010 storm event. BTM Engineering acquired the Climatological Data in hourly increments from the Kentucky Climate Center as recorded at Blue Grass Airport during the May 1 – May 2, 2010 storm event. This data, along with the videos and photos, was utilized to calibrate the model to this flooding event.

Resident Questionnaires – LFUCG's Standard Resident Questionnaire was submitted for completions for the property owners located 401, 405, 420 Plainview Road. To date completed questionnaires have been returned to BTM Engineering from the residents at 405 and 420 Plainview Road.

Existing Conditions

The completed resident questionnaire for 405 Plainview Road documents a history of structural flooding due to excessive stormwater runoff from upstream properties within the subject watershed. The majority of the overland stormwater runoff collects in the existing sag of Plainview Road and then spills into the lower part of the property at 405 Plainview Road. The questionnaire also documents chronic sanitary sewer overflows and backups on this property. It should be noted that the downstream detention basin has not been analyzed as part of this study. Due to photographic and video evidence, the basin appears to have been designed for the watershed and has capacity. The submitted resident questionnaire from the property owner at 420 Plainview Road documents flooding in the rear low laying areas of the properties located at 432, 428, 424, 420, 416, 408, 396 Plainview Road and 489, 481, 477, 473 Channing Way. Our initial site visit discovered a partially defined swale within the rear of these properties that outlets along the west side of 396 Plainview Road into the sag of the street. It appears that over the course of time outbuildings and fences have been constructed within this swale. A review of the recorded subdivision plat indicates that there is no apparent documentation of a dedicated storm sewer easement at the rear of these properties.

A continuous SWMM model that reflected the historic May 2, 2010 storm was created and calibrated to match the recorded and documented flooding elevations at 401 and 405 Plainview Road. Stabilization techniques were utilized in the inertia settings to ensure a model that reflected real world conditions. Once created and calibrated the required LFUCG design storms were analyzed with the following results:

Storm Event	Existing Flood Elevation (CB A-3 / CB A-4)*	Overland Flow (from the street)
May 2, 2010	986.34/985.43	4.16 cfs
10 year 24 hour	986.40/986.49	12.75 cfs
25 year 24 hour	986.48/986.59	27.20 cfs
100 year 24 hour	986.49/986.64	28.53 cfs

* Existing Plainview Road Catch Basin Throat Elevation @ Sag = 985.25'

Alternative Solutions (405 Plainview Road)

Due to the severity of the structural flooding at 405 Plainview Road and significant street flooding in front of 401 Plainview Road, prioritization was given to determine solutions to mitigate the situation. Five alternative solutions were analyzed in order from least cost to greater cost.

Alternative Solution #1 (Not recommended)

The existing 42" RCP outlet pipe that runs behind the rear of the home at 405 Plainview Road has a small amount of capacity remaining. The first iterative alternate investigated involved installing an additional drop inlet directly above the existing 42" RCP (PRO DI) at the property line between 401 and 405 Plainview Road and re-grading the properties to intercept the overland flow to redirect it away from finished basement floor, which is at an elevation of 983.40. This approach showed that the proposed inlet would surcharge above the floor elevation, thus is not recommended.

Storm Event	Pro DI** 982.90	Flood Elevation (CB A-3, CB A-4)*	Overland Flow (from the street)
May 2, 2010	984.79	986.36/985.73	20.27 cfs
10 year 24 hour	984.87	986.42/986.49	14.80 cfs
25 year 24 hour	984.04	986.55/986.63	38.05 cfs
100 year 24 hour	984.90	986.65/986.74	62.75 cfs

* Existing Plainview Road Catch Basin Throat Elevation @ Sag = 985.25'

** Existing FFE of 405 Plainview Road = 983.40'

Pros (+):	Cons (-): Continued home and street flooding
	Continued SSO issues
	Continued home sanitary sewer flooding

Alternative Solution #2 (Not recommended)

The second piping alternate is to leave the existing 42" Pipe in place, adding the same drop inlet (Pro DI) and adding a parallel 42" pipe to the outside (away from the home). This will require that the MH A-2 in front of the house at 401 Plainview Road be replaced with a minimum 4'x8' junction box to incorporate the 24" and 36" inlet pipes from Plainview Road and the out letting double 42" pipes leading to the existing detention basin. This solution does not give adequate freeboard between the FFE of the home at 983.40 and the hydraulic grade line elevations. Unacceptable Street flooding will still exist with this alternative. Therefore it is not recommended.

Storm Event	Pro DI** 982.90	Flood Elevation (CB A-3 / CB A-4)*	Overland flow (from the street/ from DI to detention basin) (cfs)
May 2, 2010	981.34	985.83 / 985.30	0
10 year 24 hour	982.35	985.59 / 985.29	0
25 year 24 hour	982.87	985.88 / 985.47	0 (note street floods for 23 minutes)
100 year 24 hour	982.85	985.38 / 985.77	0 (note street floods for 27 minutes)

* Existing Plainview Road Catch Basin Throat Elevation @ Sag = 985.25'

** Existing FFE of 405 Plainview Road = 983.40'

Pros (+):	Cons (-): Continued home and street flooding
	Continued SSO issues
	Continued home sanitary sewer flooding

Alternative Solution #3 (Not recommended)

The third piping solution is to install an elliptical pipe to replace the existing 42" pipe. We first analyzed a 68"x 43" elliptical pipe (54" Equivalent) to increase the waterway area from 10.2 sf to 16.6 sf. Flanker boxes at each side of the sag curb inlets on Plainview Road were also added to attempt to reduce the street flooding. This solution does not give adequate freeboard between the FFE of the home at 983.40 and the potential storm elevations. The following table summarizes the results:

Storm Event	Pro DI** 982.90	Flood Elevation (CB A-3 / CB A-4)*	Overland flow (from the street) (cfs)
May 2, 2010	982.90	985.78 / 985.43	0 / 0
10 year 24 hour	982.90	985.65 / 985.36	0 / 0
25 year 24 hour	982.40	985.89 / 985.52	0 (note street holds water for 22 minutes)
100 year 24 hour	982.90	985.80 / 985.88	0 (note street floods for 30 minutes)

* Existing Plainview Road Catch Basin Throat Elevation @ Sag = 985.25'

** Existing FFE of 405 Plainview Road = 983.40'

Pros (+):	Cons (-): Continued home and street flooding
	Continued SSO issues
	Continued home sanitary sewer flooding

Alternative Solution #4

The fourth solution is to replace the existing 42" with an 8'x4' box culvert. ***Please See Sheet C4.0 in the Appendices of this Report.*** This box culvert would increase the waterway area from 10.2 sf to 30 sf allowing more stormwater flow to migrate down into the system. One of the repercussions of this is the

backflow into the smaller pipes in front of 401 & 405 Plainview Road. The 18” and 24” pipes that cross the roadway and connects to the proposed large junction box (Manhole Junction A-2) would have to be upsized to 24” and 36” in diameter to offset this surcharging back into the system. This alternative solution is the only piped solution which lowers the hydraulic grade line to provide adequate freeboard to the basement FFE of the home. The following table summarizes the results:

Storm Event	Pro DI** 982.90	Flood Elevation (CB A-3 / CB A-4)*	Overland flow (from the street / from DI to detention basin)
May 2, 2010	980.89	985.86 / 985.45	0 (note street floods for 14 minutes)
10 year 24 hour	982.76	985.64 / 985.34	0 (note street floods for 5 minutes)
25 year 24 hour	981.52	985.63 / 985.35	0 (note street floods for 5 minutes)
100 year 24 hour	982.46	985.74 / 985.45	0 (note street floods for 11 minutes)

* Existing Plainview Road Catch Basin Throat Elevation @ Sag = 985.25’

** Existing FFE of 405 Plainview Road = 983.40’

Pros (+): Significantly reduces home flooding.	Cons (-): Continued SSO issues
Significantly reduces street flooding.	Continued home sanitary sewer flooding
	Construction impacts to properties

The preliminary opinion of probable cost for Alternative 4 is \$311,151. ***Please See the Breakdown of the Preliminary Opinion of Probable Cost in the Appendices of this Report.*** If Alternative #4 is chosen, the following measures should be taken in conjunction with the pipe remediation:

- The yard and driveway should be regraded to create a “spillway” or open channel to convey any storm water away from the house structure and into the existing detention basin.
- The foundation of the home should be protected with a “french drain” system of clean stone backfill and perforated pipe, daylighting as high as possible in elevation at the detention basin to avoid back charging the foundation system. This swale and French drain system should at a minimum provide 2’ of elevation relief below the basement FFE.
- The garage should be protected by the removal of the existing small trench drain, and a larger, higher capacity trench drain installed that connects to a secondary line parallel with the trunk system, and daylights to the detention basin. A 15” RCP pipe should be the minimum pipe size. This system would not be able intercept any flow that overtops the roadway, but would only divert residual yard flow from neighbors to the north east.
- A third minor collection line should be installed at the rear of the 401/405 Plainview property as well and daylighted to the detention basin. Approximately 0.75 acres of overland flow contributes to the backyard overland flow of 405 Plainview. A collection system of minimum pipe size of 15” RCP consisting of surface inlets, berms, and swales in the rear of the adjoining properties would aid in eliminating this flow contribution to the yard flooding of 405 Plainview Road.

- Sanitary cross connections with storm sewers should be physically disconnected. It has been reported via Lex-Call and documented via emails that cross connections are evident by smoke tests in the area.
- The basement of 405 Plainview Road appears also to be flooding by surcharged waters that are following the pipe backfill of the sanitary sewer. Video evidence shows floodwater/sewer water flooding into the finished floor of the home around the wax seal of the basement toilet fixture. It is recommended that the property owner physically disconnect and plug the existing basement lateral connection and install a grinder pump with a new lateral that will outlet into the existing sanitary sewer system at the front of the house along Plainview Road. A back flow prevention system should be installed on this new line. Please note that this solution may still result in basement floor heaving under hydrostatic pressure if the aforementioned french drain and swale system isn't installed to provide relief from surcharged ground and flood waters.

Alternative Solution #5

Purchase the property at 405 Plainview Road and remove the structures. (Refer to appendix for Fayette County PVA listing of property). Current Fayette County PVA records indicate that the home is valued at \$165,000. For the preliminary opinion of probable costs, we have added 25% to cover purchasing, relocation, time and property owner inconvenience for a total of \$206,250. Please note that formal appraisals shall be required prior to any legal offer to purchase the property. Once vacant this property could provide needed space for the city to improve storm and sanitary issues prevalent in the neighborhood. Due to layout, location, and elevation of the sanitary sewers, the existing piping system should be left in place. A secondary road drainage system is recommended to drain the storm water from the sag of the street through the now vacant lot. Curb inlets to the west side of the existing curb inlets should be constructed and connected to the new system. Similar to solution #4, a road cut for construction of the new pipe across Plainview Road will be required. Final routing should be coordinated with all foreseen city activities. ***Please See Sheet C5.0 in the Appendices of this Report.*** The following table summarizes the results:

Storm Event	Flood Elevation (CB A-3L / CB A-4R)*	Overland flow (from the street) (cfs)
May 2, 2010	985.66 / 985.31	0 / 0
10 year 24 hour	984.84 / 985.50	0 / 0
25 year 24 hour	985.43 / 985.66	0
100 year 24 hour	985.89/985.82	0

* Existing Plainview Road Catch Basin Throat Elevation @ Sag = 985.25'

Pros (+): Eliminates home flooding	Cons (-): Long term maintenance of lot for LFUCG
Eliminates home sanitary sewer flooding	Continued SSO issues in area
Significantly reduces street flooding	

The preliminary opinion of probable cost for Alternative 5 is \$308,277. *Please See the Breakdown of the Preliminary Opinion of Probable Cost in the Appendices of this Report.*

Rear Yard Flooding Solutions (420 Plainview Road)

The documented rear yard flooding issues at 432, 428, 424, 420, 416, 408, 396 Plainview Road and 489, 481, 477, 473 Channing Way could be mitigated with the following measures:

- Construction of a storm sewer inlet and pipe at the rear and side of the property of 396 Plainview Road. The proposed downstream storm sewer pipe would then run along the west property line of 396 Plainview Road and outlet into the storm sewer system in front of 405 Plainview Road. .
- Spot grading within the upstream rear yards of 420, 424, 428, 432 Plainview Road and 489, 481, 477, 473 Channing Way.

These measures would reduce the amount of existing rear yard overland flow that has been documented. It should be noted that only minor basement flooding at the home located at 420 Plainview Road has been documented. No other structural flooding has been documented for any of the aforementioned properties.

Shareholders Meeting

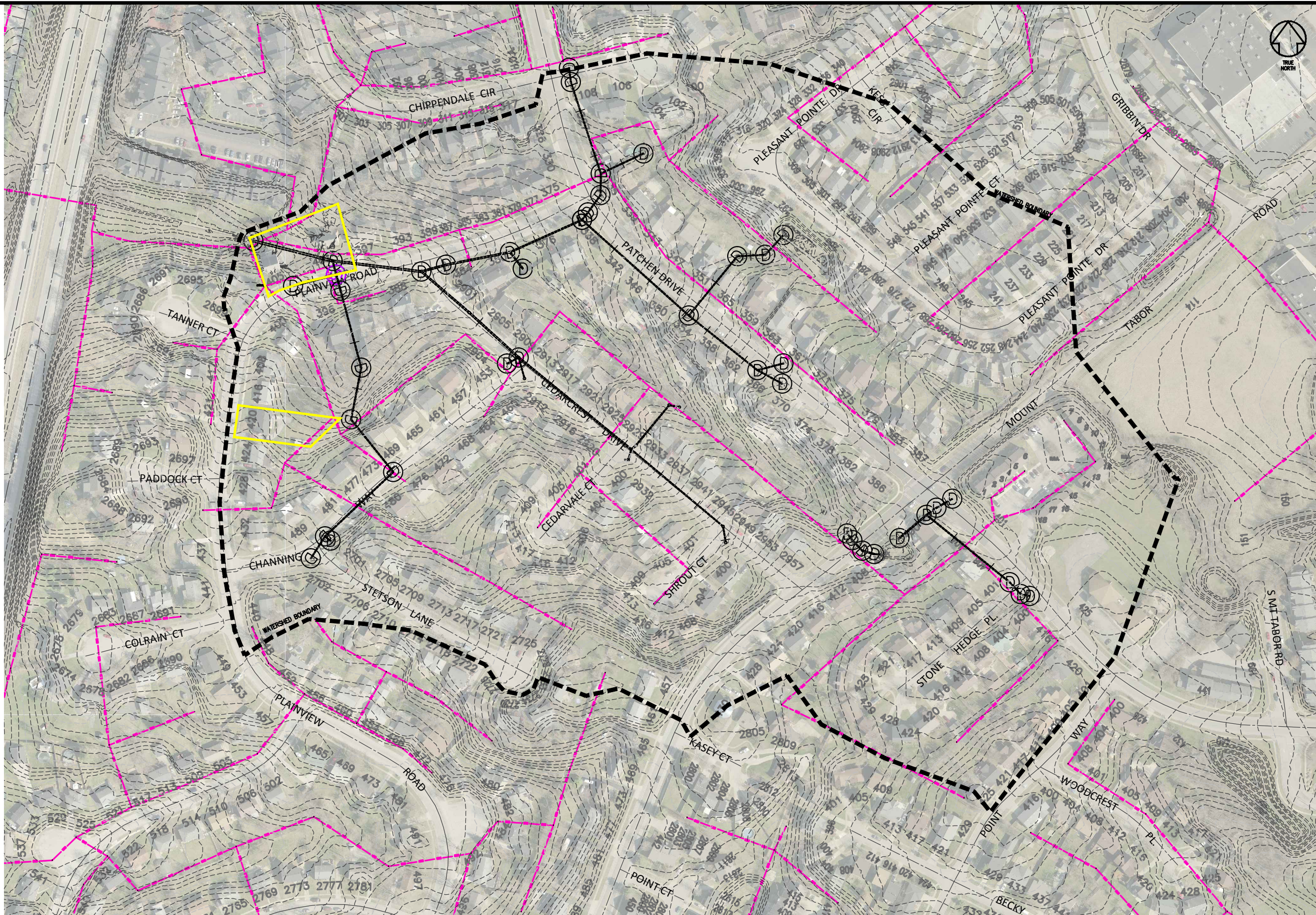
A shareholders meeting was conducted on January 24, 2011 at Lexington-Fayette Urban County Government's Phoenix Building. The attendees list is included in the appendices of this report. During this meeting all of findings and alternatives were presented to the property owners of 405 Plainview Road. The property owners expressed their desire in choosing Alternative Solution #5 due to the chronic stormwater flooding and sanitary sewer overflow issues that they have experienced.

Conclusion

Due to the nature and severity of the street and property flooding at and in the immediate vicinity of 405 Plainview Road it is recommended that prioritization be given for mitigating this area. It is our opinion that only Alternative #5 meets the goals and objectives to solve the storm and sanitary issues that the property at 405 Plainview Road has experienced. If implemented, Alternative #5 could also fit into the overall Remedial Measures Plan for the West Hickman Creek Sewershed.

The upstream rear yard flooding issues in the vicinity of 420 Plainview Road could be mitigated with a future small capital improvement project that could tie into the planned downstream improvements at 405 Plainview Road, or improvements to the yard grading by the property owner.

APPENDICES



LEGEND

- ⊙ EXISTING STORM STRUCTURE
- ===== EXISTING STORM SEWER
- WATERSHED BOUNDARY OF APPROX. 53 AC (+/-) WATERSHED

GRAPHIC SCALE: 1"=200'



TRUE NORTH

REVISIONS

NO.	BY	DATE	DESCRIPTION

BTM Engineering, Inc.

CONSULTING ENGINEERS, LANDSCAPE ARCHITECTS AND PLANNERS

80 COWELL DRIVE SUITE 130

LEXINGTON, KENTUCKY 40509

3001 TAYLOR SPRINGS DRIVE

LOUISVILLE, KENTUCKY 40220

DATE

SIGNATURE

TITLE: EXISTING CONDITION
TOPOGRAPHIC SURVEY AND EXHIBIT
AERIAL MAPPING VIA LFUGG

CLIENT: LEXINGTON FAVETTE URBAN COUNTY GOV.
DIVISION OF WATER QUALITY
200 EAST WINE STREET
LEXINGTON, KY 40507

SITE INFORMATION:
VARIES (SEE PLAN)

DRAWN BY: SEC

CHECKED BY: EHM

DATE: 1/20/11

DRAWING: 100403-STIM.DWG

SCALE: 1" = 200'

SHEET

C1.0



DATE _____

SIGNATURE	
100403	

TRAIN BY: SEG	CHECKED BY: EHM
DATE:	

SCALE: 1" = 40'

HEET

C40

C4.0

PROPOSED STORM SEWER

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Project Name :		Plainview/Patchen Drive			
Engineering Firm:		BTM Engineering			
Date: January 24, 2011					
Add Additional Street System					
Preliminary Opinion of Probable Cost (Purchase 405 Plainview)					
#	Item	Unit	Price	Units	Cost
1	Demolition (including Structure, Edge Key of asphalt, Asphalt replacement, concrete removal, Clearing and Tree Trimming, misc)	LS	\$21,280	1	\$21,280
2	Mobilization (erosion control, misc)	LS	\$2,128	1	\$2,128
3	Landscaping, screening, fencing	LS	\$5,000	1	\$5,000
4	Seeding and mulching areas of disturbed land	AC	\$1,550	1	\$1,550
5	Purchase home*	EA	\$206,250	1	\$206,250
6	36" RCP Storm Sewer (0-8' No rock)	LF	\$92	93	\$8,585
7	24" RCP Storm Sewer (0-8' No rock)	LF	\$66	119	\$7,798
8	Curb Box Inlet Type A	EA	\$3,430	4	\$13,720
9	Pipe Tie-in into structure	EA	\$819	3	\$2,457
10	Type A Surface Inlet	EA	\$2,605	2	\$5,210
11	No. 57 Stone	TN	\$21	195	\$4,115
12	Lex Storm Sewer Manhole (6' dia.) (0-8' No rock)	EA	\$3,903	2	\$7,805
13	Curb and Gutter (match existing)	LF	\$22	50	\$1,100
Contingency (10%)					\$21,280
Construction Cost					\$308,277

*Please note that a formal appraisal shall be performed by LFUCG prior to any legal offer to purchase the property.

Total Project Budget	\$308,277
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Project Name :		Plainview Road / Patchen Drive			
Engineering Firm:		BTM Engineering			
Date: January 24, 2011					
	Box Culvert (no sanitary measures)				
Preliminary Opinion of Probable Cost (Add drop inlet, secondary system)					
#	Item	Unit	Price	Units	Cost
1	Demolition	LS	\$34,572	1	\$34,572
2	Mobilization (set up, staging, misc)	LS	\$23,048	1	\$23,048
3	Drop Box Inlet Type 13	EA	\$1,550	2	\$3,100
4	Seeding and mulching areas of disturbed land	AC	\$1,550	1	\$1,550
5	Sodding	SY	\$5	2,500	\$11,250
6	15" RCP Storm Sewer (0-8' No rock)	LF	\$53	124	\$6,584
7	Type A Surface Inlet	EA	\$2,605	3	\$7,815
8	Dense Graded Aggregate Base	TN	\$20	265	\$5,419
9	No. 57 Stone	TN	\$21	1,346	\$28,401
10	Earthwork	CY	\$13	1,500	\$18,750
12	Pipe Tie-in into structure	EA	\$819	2	\$1,638
13	Curb and Gutter (match existing)	LF	\$22	50	\$1,100
14	Trench Drain with Grate	LF	\$125	26	\$3,250
19	8'x4' Box Culvert	LF	\$650	172	\$111,800
20	Curb Box Inlet Type A	EA	\$3,430	4	\$13,720
21	36" RCP Storm Sewer (0-8' No rock)	LF	\$92	30	\$2,769
22	24" RCP Storm Sewer (0-8' No rock)	LF	\$66	35	\$2,294
23	8x4 Junction box with top slab	EA	\$6,860	1	\$6,860
24	15" Impact Stilling Basin	EA	\$2,091	2	\$4,183
Contingency (10%)					\$23,048
Construction Cost					\$311,151

Total Project Budget	\$311,151
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Resident Questionnaire
Stormwater Drainage Issues

(Please complete and return in the enclosed stamped envelope as soon as possible.)

First Name: TERESA & Adam Last Name: Brumfield

Street Address (specify if mailing address is different):

405 Plainview Rd

City: Lex State: KY Zip: 17

Telephone: Work: (859) 266-3990 Home: (859) 230-7245

General Information:

1. How long have you lived at this address? Since Sept 2001
2. Has stormwater ever flooded your property? Yes ☒ No ☐

If Yes,....

3. What were the limits of flooding? (check all that apply)
- | | | |
|-----------|------------------------------|-----------------------------|
| In Yard | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| In Street | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| In House | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
4. In the last ten years, how many times has your home flooded to some extent?
1 time: ☐ 2 times: ☐ 5 times: ☐ 10 or more times: ☒
5. Can you recall the month and year of any stormwater flooding events? If so, please indicate them below;

too many to mention. See Lex Call log.

6. When did the worst stormwater flooding event occur? Month: July Year: 2010

7. During this event, how long did it take for the water to drain after the highest level was reached?

4 hours: ☒ 12 Hours: ☐ 1 day: ☐ 2 days or more: ☒

8. After this event, how long did water stand in....

streets?: 4 hours: ☒ 12 hours: ☐ 1 day: ☐ 2 days or more: ☐
yard?: 4 hours: ☐ 12 hours: ☒ 1 day: ☐ 2 days or more: ☐

9. Do you have any photographs or videos of your flooding property or neighborhood?

Yes ☒ No ☐

10. If yes, would you allow us to review and copy these photos and/or videos?

Yes ☒ No ☐ you have them. if you need more let

11. Are storm drains or ditches located on your property? Yes ☒ No ☐ vs know.

12. Are there existing drainage easements on your property? Yes ☒ No ☐
13. Have you observed stream flooding in the vicinity of your house? Yes ☐ No ☒
14. If yes, what month and year? _____
15. Have you ever observed manholes overflowing in the vicinity of your house?
Yes ☒ No ☐
16. Have you contacted LFUCG previously about this problem? Yes ☒ No ☐
If yes, when: for the last 7 years I've been trying
With whom did you speak: David Bennett, Charles Martin, Greg Luebke
Ke Prossie, Julie Brault, Rod Jarvis, Carol Scholtz
17. Has any activity such as new construction, landscape, etc. occurred over the years that may have caused or increased your drainage problem? Yes ☐ No ☒
If yes, describe

18. Do you have a sump pump? Yes ☐ No ☒
19. Where does the sump pump discharge? Yard ☐ Storm Sewer ☐
Sanitary Sewer ☐ Not Sure ☐
If other, please describe _____
20. Have you experienced any sanitary sewer backups (through sinks, toilets, etc)?
Yes ☒ No ☐
21. Have you noticed sanitary sewer odors during flooding events? Yes ☐ No ☐

Structural Flooding:

most of the time there is an odor
indoors and out.

If water entered your house.....

22. What area of your house flooded?
Basement: ☒ Crawl Space ☒ First Floor ☐ Garage ☒
23. How did it enter? (Check all that apply)
- | | | | |
|-----------------|-------------------------------------|---------------------------------------|-------------------------------------|
| Through door: | <input checked="" type="checkbox"/> | Through walls and/or cracks: | <input checked="" type="checkbox"/> |
| Through window: | <input type="checkbox"/> | Sewer back-up (through toilet/sinks): | <input checked="" type="checkbox"/> |
| Floor drain: | <input type="checkbox"/> | Other: <u>under the toilet</u> | <input checked="" type="checkbox"/> |

Street Flooding:

24. During street flooding events have you witnessed the following:

- a. Automobiles stalled in water? Yes ☒ No ☐
b. Emergency vehicles unable to pass? Yes ☒ No ☐

If yes, how many times and approximately when?

4 times since 2001

Flooding Sketch:

The drawing on the attached sheet is a picture of the general area in which we believe your property is located. On the drawing please locate your house by the street address number and follow the instructions on how to sketch your flooding problems.

1. Outline and shade in the areas on your property and the adjacent properties where you recall flooding to have occurred during the worst storm event you can remember.
2. If stormwater entered your house, please place a big dot or star where you believe the water entered your house and name the "opening" through which it came (i.e. basement window, back basement door, floor drain, etc.....)

Remember to sketch....

where the highest level to which water has flooded on your property is located?

Please refer to a fixed object like a tree or part of the house and indicate how high the water rose (i.e. "The water was 2" deep on the big tree in my back yard.").

Stormwater { 2 1/2 FT in driveway on fence, very fast moving rapid water.
3-4" in garage & Basement.

Sewer { ~~continuous~~
CONTINUOUS flooding from under toilet, would reach 20 or more inches if we allowed it to, lots of "Bailout."

Briefly describe drainage problems: Our lot is the lowest point of the whole area, all the water from every direction comes to our lot. If it rains a lot in a short time it comes under our garage door. If it rains for a long time it blows the sewer man hole covers off & blows our toilet ring then the ^{sewer} water comes in our basement. After the tables goes down the water ^{recedes}

THANK YOU FOR YOU TIME!



Resident Questionnaire
Stormwater Drainage Issues

(Please complete and return in the enclosed stamped envelope as soon as possible.)

First Name: Elizabeth / Michael Last Name: Keeboetz

Street Address (specify if mailing address is different):

420 Plainview Rd

City: Lex State: KY Zip: 40517

Telephone: Work: () Home: () 859 619 4418 / 859 619 4424

General Information:

1. How long have you lived at this address? 5yr

2. Has stormwater ever flooded your property? Yes ☒ No ☐

If Yes,....

3. What were the limits of flooding? In Yard Yes ☒ No ☐
(check all that apply) In Street Yes ☒ No ☐
In House Yes ☒ No ☐

4. In the last ten years, how many times has your home flooded to some extent?
1 time: ☐ 2 times: ☐ 5 times: ☐ 10 or more times: ☒

5. Can you recall the month and year of any stormwater flooding events? If so, please indicate them below; Unable to recall the months but the flooding occurs anytime we get more than a light rain

6. When did the worst stormwater flooding event occur? Month: _____ Year: _____

7. During this event, how long did it take for the water to drain after the highest level was reached?
4 hours: ☒ 12 Hours: ☐ 1 day: ☐ 2 days or more: ☐

8. After this event, how long did water stand in....
streets?: 4 hours: ☒ 12 hours: ☐ 1 day: ☐ 2 days or more: ☐
yard?: 4 hours: ☐ 12 hours: ☒ 1 day: ☐ 2 days or more: ☐

9. Do you have any photographs or videos of your flooding property or neighborhood?
Yes ☐ No ☐

10. If yes, would you allow us to review and copy these photos and/or videos?
Yes ☐ No ☐

11. Are storm drains or ditches located on your property? Yes ☒ No ☐

12. Are there existing drainage easements on your property? Yes ☐ No ☒
13. Have you observed stream flooding in the vicinity of your house? Yes ☒ No ☐
14. If yes, what month and year? Year Round - Every Year
15. Have you ever observed manholes overflowing in the vicinity of your house?
Yes ☐ No ☒
16. Have you contacted LFUCG previously about this problem? Yes ☐ No ☒
If yes, when: _____
With whom did you speak: _____
17. Has any activity such as new construction, landscape, etc. occurred over the years that may have caused or increased your drainage problem? Yes ☒ No ☐
If yes, describe
Some work was done about 15-20 years ago
that made the problem worse

18. Do you have a sump pump? Yes ☒ No ☐
19. Where does the sump pump discharge? Yard ☒ Storm Sewer ☐
Sanitary Sewer ☐ Not Sure ☐

✓ If other, please describe The pump is located in the yard to keep water out of
The House

20. Have you experienced any sanitary sewer backups (through sinks, toilets, etc)? The House
Yes ☐ No ☒
21. Have you noticed sanitary sewer odors during flooding events? Yes ☐ No ☒

Structural Flooding:

If water entered your house.....

22. What area of your house flooded?
Basement: ☒ Crawl Space ☐ First Floor ☐ Garage ☒

23. How did it enter? (Check all that apply)

Through door:	<input checked="" type="checkbox"/>	Through walls and/or cracks:	<input checked="" type="checkbox"/>
Through window:	<input type="checkbox"/>	Sewer back-up (through toilet/sinks):	<input type="checkbox"/>
Floor drain:	<input type="checkbox"/>	Other: _____	<input type="checkbox"/>

Street Flooding:

THANK YOU FOR YOU TIME!

24. During street flooding events have you witnessed the following:

- a. Automobiles stalled in water? Yes ☐ No ☒
- b. Emergency vehicles unable to pass? Yes ☐ No ☒

If yes, how many times and approximately when?

Flooding Sketch:

The drawing on the attached sheet is a picture of the general area in which we believe your property is located. On the drawing please locate your house by the street address number and follow the instructions on how to sketch your flooding problems.

1. Outline and shade in the areas on your property and the adjacent properties where you recall flooding to have occurred during the worst storm event you can remember.
2. If stormwater entered your house, please place a big dot or star where you believe the water entered your house and name the "opening" through which it came (i.e. basement window, back basement door, floor drain, etc.....)

Remember to sketch....

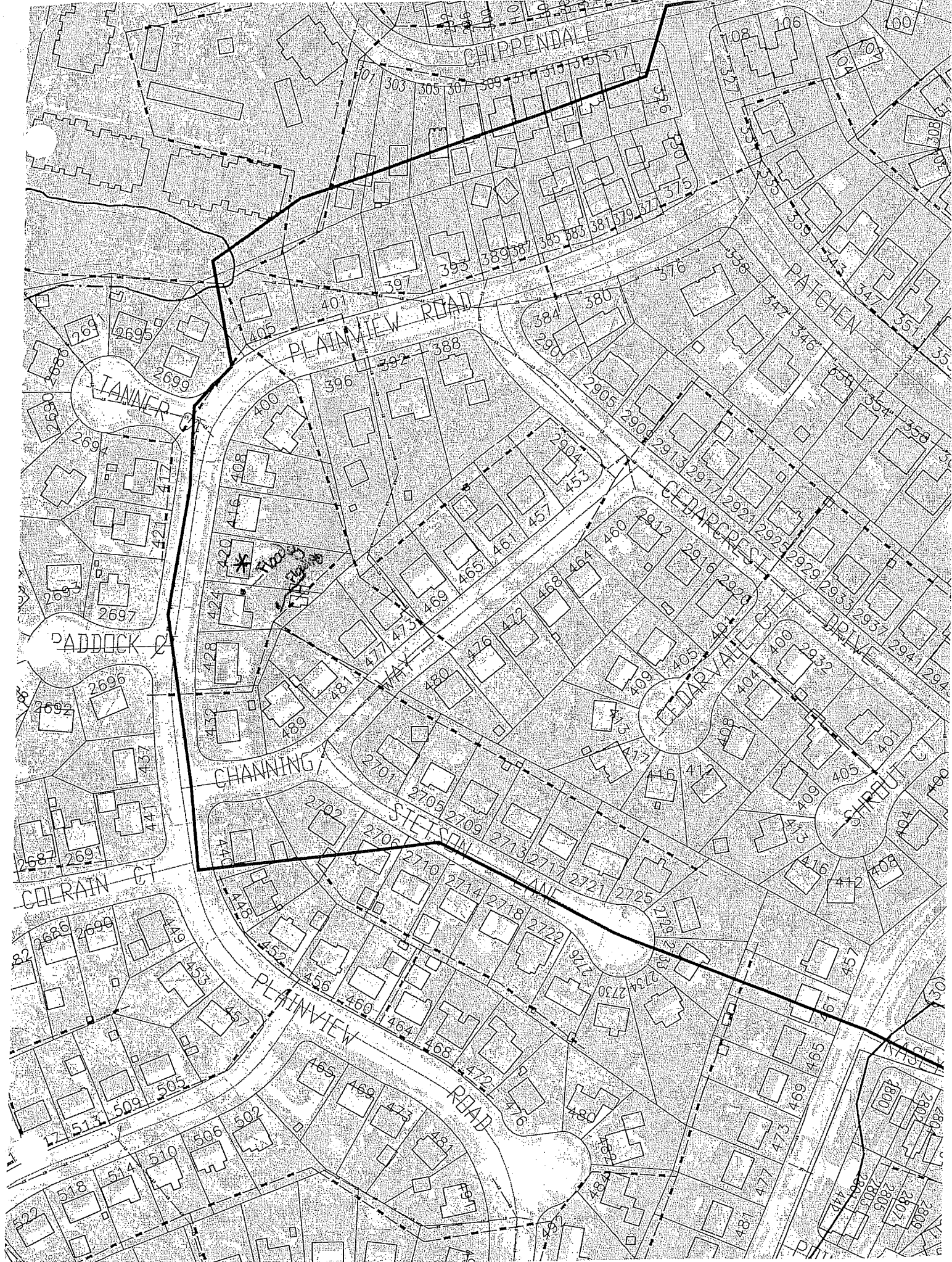
where the highest level to which water has flooded on your property is located?

Please refer to a fixed object like a tree or part of the house and indicate how high the water rose (i.e. "The water was 2" deep on the big tree in my back yard.").

Briefly describe drainage problems:

See next page

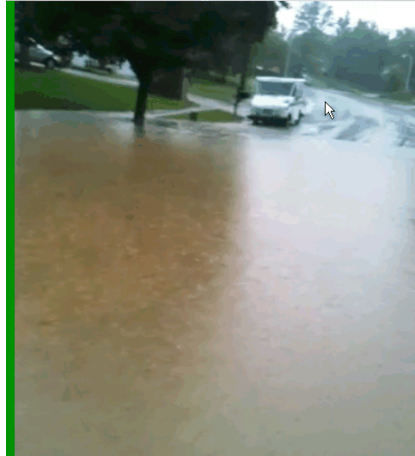
The flooding starts from Channing Way, continues to follow the low laying areas from the houses on Plainview (432, 428, 424, 420, 416, 408, 396) and from the property on Channing Way (489, 481, 477, 473) The water will travel through the lower left corner of the property at 424 Plainview and enter the property at 420 Plainview Rd where it will flood the entire back yard from 4'' to 6'' or above. The water will then exit the property at 420 Plainview Rd at the lower left corner and enter 416 Plainview at the lower right corner. The water will then enter at the lower right corner at 416 Plainview and travel through 396 Plainview till it reaches the street at the lowest level of Plainview between 400 – 396 Plainview Rd.



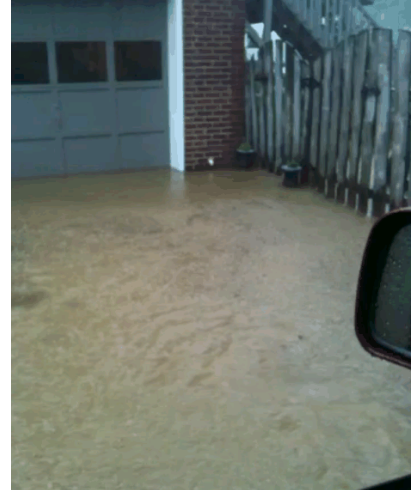
EXCERPTS OF FLOODING VIDEO TAKEN BY PROPERTY OWNER (MAY 2010 STORM)



SSO @ Rear of 405 Plainview Road



Street Flooding @ Front of 401 & 405 Plainview Road



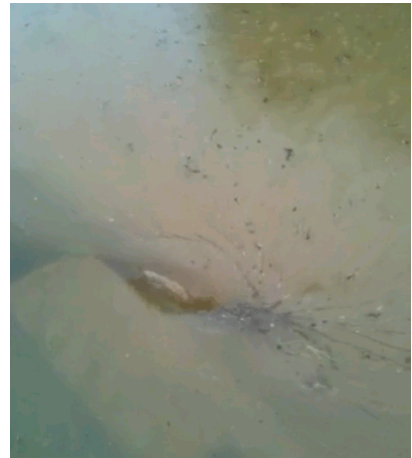
Home Flooding @ 405 Plainview Road



SSO @ Rear of 405 Plainview Road



Street Flooding @ CB A-4 in front of 401 Plainview Road



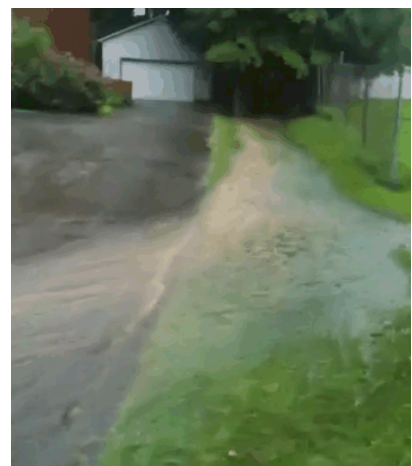
Street Flooding @ CB A-4 in front of 401 Plainview Road



Basement Toilet & Bathroom @ 405 Plainview Road



Street Flooding @ Front of 401 & 405 Plainview Road



Drainage Swale @ West Side of 396 Plainview Road

[illegible]